4241-687

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re United States Patent Application of:		**Docket No.:**	**4241-687**
Applicants:	**XU, Xueping, et al.**	**Conf. No.:**	**2122**
Application No.:	**10/714,307**	**Art Unit:**	**2822**
Date Filed:	**November 14, 2003**	**Examiner:**	**PRENTY, Mark V.**
Title:	**VICINAL GALLIUM NITRIDE SUBSTRATE FOR HIGH QUALITY HOMOEPITAXY**	**Customer No.:**	**25559**

FACSIMILE TRANSMISSION CERTIFICATE
ATTN: Examiner Mark V. PRENTY
Fax No. (703) 872-9306

I hereby certify that this document is being filed in the United States Patent and Trademark Office, via facsimile transmission to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **April 21, 2005**, to United States Patent and Trademark Office facsimile transmission number **(703) 872-9306**.

Number of Pages (including cover)

Steven J. Hultquist

April 21, 2005
Date

RESPONSE TO RESTRICTION REQUIREMENT IMPOSED IN MARCH 21, 2005 OFFICE ACTION IN U.S. PATENT APPLICATION NO. 10/714,307

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This responds to the March 21, 2005 Office Action in the above-identified application.

REMARKS

Restriction/Election

In the March 21, 2005 Office Action, the Examiner imposed a restriction requirement against claims 1-39, and required that an election be made between:

Group I: Claims 1-21 and 39, drawn to a semiconductor substrate; and

Group II: Claims 22-38, drawn to a method of making a semiconductor device.

Applicants hereby elect, with traverse, Group I claims 1-21 and 39.

The traversal is based on the fact that (i) the restriction requirement is *prima facie* deficient in satisfying the criteria of 35 USC §121 and (ii) the restriction requirement lacks proper support for the assertion of distinctiveness, which was the sole basis presented in the Office Action for the restriction requirement.

35 USC § 121 provides, *inter alia*, that:

> **"[I]f two or more independent and distinct inventions are claimed in one application, the Director may require the application to be restricted to one of the inventions."**

Thus, claimed subject matter, in order to satisfy the requirements of §121, must be both independent and distinct. If only one of such criteria is satisfied, then a restriction requirement cannot be lawfully imposed.

In the March 21, 2005 Office Action, the only basis presented for the restriction requirement is that "[T]he inventions are distinct, each from the other." Thus, the restriction requirement is improper, since there is no showing in the record of independence of subject matter and the respective Groups of claims.

Further, the subject matter of the Group I and Group II claims in fact is not independent, but rather related and *inter*dependent. Independent claim 1, of the Group I claims, recites the following GaN structure:

"1. A **GaN substrate including a GaN (0001) surface offcut from the <0001> direction predominantly towards a direction selected from the group consisting of <10$\bar{1}$0> and <11$\bar{2}$0> directions, at an offcut angle in a range that is from about 0.2 to about 10 degrees, wherein said surface has a RMS roughness measured by 50 x 50μm^2 AFM scan that is less than 1 nm, and a dislocation density that is less than 3E6 cm^{-2}.**" (Emphasis added)

and independent claim 22, of the Group II claims, a method of forming such a GaN structure:

"22. A method of forming a **GaN substrate including a GaN (0001) surface offcut from the <0001> direction predominantly towards a direction selected from the group consisting of <10$\bar{1}$0> and <11$\bar{2}$0> directions, at an offcut angle in a range that is from about 0.2 to about 10 degrees, wherein said surface has a RMS roughness measured by 50 x 50μm^2 AFM scan that is less than 1 nm, and a dislocation density that is less than 3E6 cm^{-2}**, said method including growing a bulk GaN single crystal body, and processing said bulk GaN single crystal body to form at least one wafer therefrom, wherein said processing step includes a step selected from the group consisting of: (i) a slicing step conducted in a slicing plane tilted away from the c-plane at said offcut angle in said direction selected from the group consisting of <10$\bar{1}$0> and <11$\bar{2}$0> directions, (ii) an angle lapping step conducted in a lapping plane tilted away from the c-plane at said offcut angle in said direction selected from the group consisting of <10$\bar{1}$0> and <11$\bar{2}$0> directions, and (iii) separating said bulk GaN single crystal body after growing said bulk GaN single crystal body on a vicinal heteroepitaxial substrate including a (0001) surface offcut from the <0001> direction predominantly towards a direction selected from the group consisting of <10$\bar{1}$0> and <11$\bar{2}$0> directions, at an offcut angle in said range of from about 0.2 to about 10 degrees." (Emphasis added)

It therefore is seen that the boldfaced text in both claims is identical, reflecting the fact that the subject matter of the respective claims of both Groups is intimately closely related. On such basis, the restriction requirement is in error, and should properly be withdrawn.

Apart from the foregoing lack of independence between the Group I in Group II claims, on which basis alone the research requirement is improper, it also is to be pointed out that the asserted basis for distinctiveness is unsupported and appears to be solely based on the Examiner's speculation that etching of a bulk GaN single crystal body would be sufficient to form the GaN structure of the Group I claims, e.g., as claimed in claim 1. There is no evidence or basis of record that supports such a contention. Further, applicants are unaware of any currently available etching process that is capable of producing the recited GaN structure. The Examiner therefore is requested to make of record information concerning an etching process that would be suitable to make the recited GaN substrate, in support of the restriction requirement. Alternatively, the Examiner is requested to withdraw the restriction requirement.

As a further point, it is noted that the subject matter of the Group I and Group II claims are sufficiently closely related as to be examinable without serious burden to the Examiner. According to the MPEP, if the claims can be examined without serious burden to the Examiner, the Examiner must examine all claims on the merits, even if the claims are considered as independent or distinct inventions. See MPEP §803.

It therefore is requested that the restriction requirement be reconsidered, and that the claims of Groups I-II (claims 1-39) be retained in consolidated form for further examination and prosecution on the merits.

If the restriction requirement is nonetheless made final, applicants alternatively request rejoinder of method claims 22-38 under the provisions of MPEP §821.04, upon confirmation of allowable subject matter of the article claims 1-21 and 39.

Such rejoinder would be fully proper under these circumstances for the following reasons.

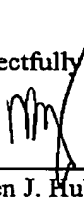
When an application as originally filed discloses a product and the process for making and/or using such product, and only the claims directed to the product are presented for examination,

when a product claim is found allowable, applicant may present claims directed to the process of making and/or using the patentable product for examination through the rejoinder procedure in accordance with MPEP §821.04, provided that the process claims depend from or include all the limitations of the allowed product claims.

CONCLUSION

Based on the foregoing, pending claims 1-39 are in form and condition for examination. If any additional issues remain, the Examiner is requested to the undersigned attorney at (919)419-9350 to discuss same.

Respectfully submitted,



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